Cargill Salt

Watkins Glen Plant
518 East 4th Street
Watkins Glen, NY 14891

October 8, 2010

Luis Rodriguez
Underground Injection Control Section
U. S. Environmental Protection Agency Region 2
290 Broadway
New York, New York 10007-1866

Ref: UIC Permit NYU105431

Dear Mr. Rodriguez:

Two class III salt solution mining wells, Wells 26 and 27, were tested on October 8 at our Watkins Glen, New York facility using the water-brine interface method. Test reports for both wells are enclosed. These wells have been returned to service.

If you have any questions, please call me at 970-875-0124 or email to mike_schumacher@cargill.com.

Sincerely,

Michael J. Schumacher
Solution Mining Manager

enclosures

cc: D. Chutas

CARGILL INCORPORATED
WATER-BRINE INTERFACE
MECHANICAL INTEGRITY TEST REPORT

Address

Cargill Salt
Watkins Glen Plant
518 E. 4th Street
Watkins Glen , New York 14891
(607) 535-6300

General Information

UIC Permit	**NYU105431**
Field	**Watkins Glen**
Test well	**27**
Reference well	**29**
Other wells in gallery	**26, 28**
Test well location	**Lat. 42°-22'-49", Long. 76°-51'-41"**
	Watkins Glen, New York
API No.	**31-097-22812**
Test Date	**10/8/2010**
Test fluid	**Water**
Result	**PASSED TEST**

Test well data

Well no.	**27**		
Depth of surface casing	**996**	ft.	**Drilling record**
Depth to top of salt formation	**1785**	ft.	**4/00 density log**
Depth to top of cavern	**2340**	ft.	**estimated**
Depth of production casing	**2512**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**unknown**	ft.	**Drilling record**
Original total depth	**3661**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or annulus	**1.6535**	gpf	
Volume of casing or annulus	**4154**	gals.	
Normal operating pressure	**300**	psig	
Mode of last 24 hours of operation	**Water injection**		

All depths referenced to wellhead , elev. 455

Reference well data

Well no.	**29**		
Depth of surface casing	**1118**	ft.	**Drilling record**
Depth to top of salt formation	**1809**	ft.	**11/02 density log**
Depth to top of cavern	**2380**	ft.	**estimated**
Depth of production casing	**2546**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2658**	ft.	**Drilling record**
Original total depth	**2658**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or tubing	**1.6535**	gpf	
Volume of casing or tubing	**4210**	gals.	

All depths referenced to wellhead , elev. 455

Target Depth for Interface

Normally 50 feet above the end of the casing or the cavern roof, whichever is shallower

Depth **2340** ft.

Instrumentation

Well	Test	Reference
Manufacturer	**Paroscientific**	**Paroscientific**
Model	**765-1K**	**765-1K**
Serial No.	**115418**	**112333**
Accuracy	**0.01%**	**0.01%**
Precision	**0.001 psi**	**0.001 psi**

Preparation

If the casing of the test well was most recently used for brine production, flush with water to remove any crystallized salt.

Date and time test well was flushed	**not flushed, last used for water injection**
Approximate volume in gallons	
Shut-in period with water in casing	
Comments	
Second date and time well was flushed	
Approximate volume in gallons	
Shut-in period with water in casing	
Comments	

The test well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the casing or annulus.

Date test well was bled back	**10/06/10**
Approximate volume in gallons	**6,930**
Specific gravity of fluid	**1.088**
Comments	

The reference well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the tubing or casing.

Date and time ref well was bled back	**10/05/10**
Approximate volume in gallons	**4,620**
Specific gravity of fluid	**1.177**
Comments	**Well last used for water injection**

Set Interface

Test fluid	**Water**
Specific gravity of test fluid	**1.000**
Specific gravity of brine	**1.088**

Calculate maximum permissible injection rate and target pressure differential.

Capacity of casing or annulus		Allowable velocity		Maximum inj. rate
1.6535 gpf	x	20 fpm	=	**33** gpm

Target interface depth x gradient diff. = target pressure diff.

2340 ft. x (1.088 - 1.000) X 0.433 = 89.2 psi

Date	**10/06/10**				change
	Time	Test Well	Ref. Well	Diff.	in diff.
Pressures before injection	**10:35**	**192.504**	**75.400**	**117.104**	
Pressures during injection	**13:30**	**249.503**	**78.384**	**171.119**	**54.015**
Pressures during injection	**14:20**	**274.901**	**79.785**	**195.116**	**78.012**
Pressures during injection	**14:32**	**278.027**	**79.924**	**198.103**	**80.999**
Pressures during injection	**14:55**	**286.544**	**80.406**	**206.138**	**89.034**
Pressures after injection	**15:10**	**286.751**	**80.437**	**206.314**	**89.210**

All pressures measured in psia

Calculated final interface depth

89.210 psi / ((1.088 - 1.000) X 0.433) = 2341 ft.

Note : 4158 gallons of water pumped, measured by flowmeter. Injection was halted when the differential pressure stopped rising, indicating that the interface had reached the end of the casing.

Temperature Stabilization Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start Stabilization	**10/06**	**15:10**	**286.751**	**80.437**	**206.314**	
Inter. press	**10/07**	**06:00**	**283.125**	**77.752**	**205.373**	**-0.941**
Inter. press	**10/07**	**12:00**	**281.871**	**76.728**	**205.143**	**-1.171**
Inter. press	**10/07**	**18:00**	**280.825**	**75.913**	**204.912**	**-1.402**
Start of test	**10/08**	**04:00**	**279.001**	**74.251**	**204.750**	**-1.564**
Total time		**36** hrs.				

(Minimum time is 36 hours.)

The differential pressure fell slightly during the temperature stabilization period due to water leaking past a pipeline valve. A slip blind was placed in the line, and the differential stabilized.

Test Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start of test	**10/08**	**04:00**	**279.001**	**74.251**	**204.750**	
Inter. press	**10/08**	**05:00**	**278.854**	**74.127**	**204.727**	**-0.023**
Inter. press	**10/08**	**06:00**	**278.705**	**74.004**	**204.701**	**-0.049**
Inter. press	**10/08**	**07:00**	**278.551**	**73.880**	**204.671**	**-0.079**
Inter. press	**10/08**	**08:00**	**278.391**	**73.749**	**204.642**	**-0.108**
Inter. press	**10/08**	**09:00**	**278.225**	**73.606**	**204.619**	**-0.131**
Inter. press	**10/08**	**10:00**	**278.063**	**73.448**	**204.615**	**-0.135**
Inter. press	**10/08**	**11:00**	**277.896**	**73.297**	**204.599**	**-0.151**
End test	**10/08**	**12:00**	**277.740**	**73.174**	**204.566**	**-0.184**

Test Period **8** hrs
Average pressure change **-0.023** psi/hr

Maximum allowable pressure change is 0.05 psi/hr over 8 hours.

If the test was conducted in accordance with the method approved in the USEPA notice published in the Federal Register of August 18,1989, page 34169-34171 (as amended in Federal Register of November 14, 1989, page 47451) and the rate of pressure change during the test period was less than 0.05 psi/hour, the well has passed the test and demonstrated internal mechanical integrity.

Result : **PASSED TEST**

Comments

Test and reference well pressures were read simultaneously during the eight-hour test period. Pressures fell as undersaturated cavern brine dissolved salt. The low saturation of the cavern brine bled back in preparation for the test indicates a possiible roof fall; this does not affect the test results.

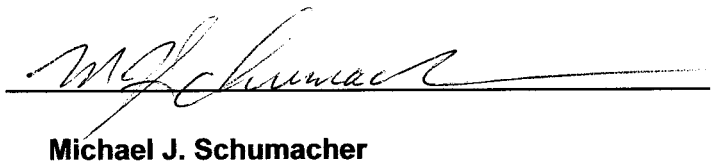
Person conducting test:

Michael J. Schumacher
Solution mining manager
Cargill Salt
916 S. Riverside Ave.
St. Clair, MI 48079
(970)875-0124

Witnessing field personnel: **None**

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for the submission of false information, including the possibility of fine and imprisonment for knowing violations.

Signature of owner/authorized agent : 

Michael J. Schumacher
Solution mining manager
Cargill Salt
916 S. Riverside Ave.
St. Clair, MI 48079
(970)875-0124

Attachments :

Field data sheets (1)
Gauge calibration certificates

FIELD DATA SHEET

TEST WELL 27 INSTRUMENT S/N 115418

REFERENCE WELL 29 INSTRUMENT S/N 112333

DATE	TIME	TEST PRESS.	REF PRESS.	DIFFERENCE	OPER. INIT.	REMARKS
						SG =
10/6/10	10:35	192.504	75.400	117.104	MA	STATIC
	11:27					START PUMPING
	13:30	249.503	78.384	171.119	MA	59.1 BBLS PUMPED
	14:05	282.211	79.281	202.930	MA	PUMPING
	14:20	274.901	79.785	195.116	MA	85.2 BBLS PUMPED
	14:32	278.027	79.924	198.103	MA	88.4 BBLS PUMPED
	14:55	286.544	80.406	206.138	MA	98.0 BBLS PUMPED
	15:10	286.751	80.437	206.314	MA	99.0 BBLS PUMPED
						COMPLETE
10/7/10	6:00	283.125	77.752	205.373	MA	TEMP STABILIZATION
	7:00	282.909	77.590	205.319	MA	
	10:00	282.267	77.076	205.191	MA	
	12:00	281.871	76.728	205.143	MA	PLACED SLIP BLIND IN LINE
	13:00	281.629	76.570	205.059	MA	
	14:00	281.446	76.444	205.002	MA	
	18:00	280.825	75.913	204.912	MA	BLED AIR OUT OF HOSE
10/8/10	4:00	279.001	74.251	204.750	MA	START TEST
	5:00	278.854	74.127	204.727	MA	
	6:00	278.705	74.004	204.701	MA	
	7:00	278.551	73.880	204.671	MA	
	8:00	278.391	73.749	204.642	MA	
	9:00	278.225	73.606	204.619	MA	
	10:00	278.063	73.448	204.615	MA	
	11:00	277.896	73.297	204.599	MA	
	12:00	277.740	73.174	204.566	MA	TEST COMPLETE

CARGILL INCORPORATED
WATER-BRINE INTERFACE
MECHANICAL INTEGRITY TEST REPORT

Address

Cargill Salt
Watkins Glen Plant
518 E. 4th Street
Watkins Glen , New York 14891
(607) 535-6300

General Information

UIC Permit	**NYU105431**
Field	**Watkins Glen**
Test well	**26**
Reference well	**29**
Other wells in gallery	**27, 28**
Test well location	**Lat. 42°-22'-45", Long. 76°-51'-51"**
	Watkins Glen, New York
API No.	**31-097-22811**
Test Date	**10/8/2010**
Test fluid	**Water**
Result	**PASSED TEST**

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Test well data

Well no.	**26**		
Depth of surface casing	**996**	ft.	**Drilling record**
Depth to top of salt formation	**1734**	ft.	**3/00 density log**
Depth to top of cavern	**2284**	ft.	**04/06 gamma ray log**
Depth of production casing	**2607**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2684**	ft.	**Drilling record**
Original total depth	**2684**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or annulus	**1.6535**	gpf	
Volume of casing or annulus	**4311**	gals.	
Normal operating pressure	**50**	psig	
Mode of last 24 hours of operation	**Brine production**		

All depths referenced to wellhead , elev. 455

Reference well data

Well no.	**29**		
Depth of surface casing	**1118**	ft.	**Drilling record**
Depth to top of salt formation	**1809**	ft.	**11/02 density log**
Depth to top of cavern	**2455**	ft.	**04/06 gamma ray log**
Depth of production casing	**2546**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2658**	ft.	**Drilling record**
Original total depth	**2658**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or tubing	**1.6535**	gpf	
Volume of casing or tubing	**4210**	gals.	

All depths referenced to wellhead , elev. 455

Target Depth for Interface

Normally 50 feet above the end of the casing or the cavern roof, whichever is shallower

Depth **2284** ft.

Instrumentation

Well	Test	Reference
Manufacturer	**Paroscientific**	**Paroscientific**
Model	**765-1K**	**765-1K**
Serial No.	**112335**	**112333**
Accuracy	**0.01%**	**0.01%**
Precision	**0.001 psi**	**0.001 psi**

Preparation

If the casing of the test well was most recently used for brine production, flush with water to remove any crystallized salt.

Date and time test well was flushed	**10/01/10**
Approximate volume in gallons	gals
Shut-in period with water in casing	**72 hours**
Comments	
Second date and time well was flushed	
Approximate volume in gallons	
Shut-in period with water in casing	
Comments	

The test well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the casing or annulus.

Date test well was bled back	**10/05/10**
Approximate volume in gallons	**4,620**
Specific gravity of fluid	**1.195**
Comments	

The reference well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the tubing or casing.

Date and time ref well was bled back	**10/05/10**
Approximate volume in gallons	**4,620**
Specific gravity of fluid	**1.177**
Comments	**Well last used for water injection**

Set Interface

Test fluid	**Water**
Specific gravity of test fluid	**1.000**
Specific gravity of brine	**1.195**

Calculate maximum permissible injection rate and target pressure differential.

Capacity of casing or annulus		Allowable velocity		Maximum inj. rate
1.6535 gpf	x	20 fpm	=	**33** gpm

Target interface depth x gradient diff. = target pressure diff.

2284 ft. x (1.195 - 1.000) X 0.433 = 192.8 psi

Date	**10/05/10**				change
	Time	Test Well	Ref. Well	Diff.	in diff.
Pressures before injection	**16:30**	**71.006**	**80.980**	**-9.974**	
Pressures during injection	**18:10**	**220.070**	**84.110**	**135.960**	**145.934**
Pressures after injection	**19:17**	**277.032**	**85.339**	**191.693**	**201.667**

All pressures measured in psia

Calculated final interface depth

201.667 psi / ((1.195 - 1.000) X 0.433) = 2388 ft.

Note : 3612 gallons of fluid injected, measured by flowmeter

Temperature Stabilization Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start Stabilization	**10/05**	**19:17**	**277.032**	**85.339**	**191.693**	
Inter. press	**10/06**	**07:28**	**273.371**	**82.692**	**190.679**	**-1.014**
Inter. press	**10/06**	**12:00**	**266.992**	**76.579**	**190.413**	**-1.280**
Inter. press	**10/06**	**16:00**	**270.409**	**80.277**	**190.132**	**-1.561**
Inter. press	**10/07**	**06:00**	**266.952**	**76.752**	**190.200**	**-1.493**
Inter. press	**10/07**	**14:00**	**265.635**	**76.444**	**189.191**	**-2.502**
Inter. press	**10/07**	**18:00**	**264.542**	**75.913**	**188.629**	**-3.064**
Start of test	**10/08**	**06:00**	**262.410**	**74.251**	**188.159**	**-3.534**
Total time		**58** hrs.				

(Minimum time is 36 hours.)

The differential pressure fell slightly during the temperature stabilization period due to water leaking past a pipeline valve. A slip blind was placed in the line, and the differential stabilized.

Test Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start of test	**10/08**	**04:00**	**262.410**	**74.251**	**188.159**	
Inter. press	**10/08**	**05:00**	**262.241**	**74.127**	**188.114**	**-0.045**
Inter. press	**10/08**	**06:00**	**262.070**	**74.004**	**188.066**	**-0.093**
Inter. press	**10/08**	**07:00**	**261.892**	**73.880**	**188.012**	**-0.147**
Inter. press	**10/08**	**08:00**	**261.706**	**73.749**	**187.957**	**-0.202**
Inter. press	**10/08**	**09:00**	**261.519**	**73.606**	**187.913**	**-0.246**
Inter. press	**10/08**	**10:00**	**261.326**	**73.448**	**187.878**	**-0.281**
Inter. press	**10/08**	**11:00**	**261.137**	**73.297**	**187.840**	**-0.319**
End test	**10/08**	**12:00**	**260.945**	**73.174**	**187.771**	**-0.388**

Test Period	**8**	hrs
Average pressure change	**-0.049**	psi/hr

Maximum allowable pressure change is 0.05 psi/hr over 8 hours.

If the test was conducted in accordance with the method approved in the USEPA notice published in the Federal Register of August 18,1989, page 34169-34171 (as amended in Federal Register of November 14, 1989, page 47451) and the rate of pressure change during the test period was less than 0.05 psi/hour, the well has passed the test and demonstrated internal mechanical integrity.

Result : **PASSED TEST**

Comments

Test and reference well pressures were read simultaneously during the eight-hour test period. Pressures fell as undersaturated cavern brine dissolved salt.

Person conducting test:

Michael J. Schumacher
Solution mining manager
Cargill Salt
916 S. Riverside Ave.
St. Clair, MI 48079
(970)875-0124

Witnessing field personnel: **None**

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for the submission of false information, including the possibility of fine and imprisonment for knowing violations.

Signature of owner/authorized agent : _____

Michael J. Schumacher
Solution mining manager
Cargill Salt
916 S. Riverside Ave.
St. Clair, MI 48079
(970)875-0124

Attachments :

Field data sheets (1)
Gauge calibration certificates

FIELD DATA SHEET

TEST WELL 26 INSTRUMENT S/N 112335

REFERENCE WELL 29 INSTRUMENT S/N 112333

DATE	TIME	TEST PRESS.	REF PRESS.	DIFFERENCE	OPER. INIT.	REMARKS
						SG = 965
10/5/10	16:30	71.006	80.980	-9.974	MA	STATIC
	16:36					START PUMPING
	18:10	220.070	84.110	135.960	MA	STATIC - 58.1 BBL
	19:17	277.032	85.339	191.693	MA	STATIC - 86.0 BBL
						COMPLETE
10/6/10	7:28	273.371	82.692	190.679	MA	
	12:00	266.992	76.579	190.413	MA	BLED BRINE FROM Z7
	16:00	270.409	80.277	190.132	MA	
10/7/10	6:00	266.952	77.752	190.200	MA	
	7:00	266.729	77.590	190.139	MA	
	10:00	266.055	76.728	189.327	MA	PLACED SLIP BLIND IN LINE
	13:00	265.838	76.570	189.268	MA	
	14:00	265.635	76.444	189.191	MA	BLED AIR FROM LINE
	18:00	264.542	75.913	188.629	MA	
10/8/10	4:00	262.410	74.251	188.159	MA	START TEST
	5:00	262.241	74.127	188.114	MA	
	6:00	262.070	74.004	188.066	MA	
	7:00	261.892	73.880	188.012	MA	
	8:00	261.706	73.749	187.957	MA	
	9:00	261.519	73.606	187.913	MA	
	10:00	261.326	73.448	187.878	MA	
	11:00	261.137	73.297	187.840	MA	
	12:00	260.945	73.174	187.771	MA	TEST COMPLETE

FLUKE ®
= DH Instruments

CALIBRATION REPORT NO. 1283471697
Calibration Date: September 13, 2010
For:
CARGILL SALT
WATKINS GLEN, NEW YORK
Purchase Order Number: 20022857
Calibration of:
Paroscientific Model 765-16B, No. 112333

QUALITY PROGRAM CONFORMANCE

All calibrations are performed in accordance with DHI Laboratory Quality Assurance Program Manual (LQAPM), Rev. D, dated October, 2009 and conform to ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO/IEC Guide 25, ISO 9002, ISO-10012-1, MIL-STD 45662A and when specified by our customers NRC regulations 10CFR50 Appendix B and 10CFR21, and/or other quality requirements defined in customers purchase descriptions.

TRACEABILITY

Traceability for pressure is maintained through the fundamental units of mass [kg] and length [m^2] and the derived unit of acceleration of gravity [m/s^2].

- The traceability of effective area is maintained through the 2010 DHI Piston-Cylinder Calibration Chain to the National Institute of Standards and Technology, NIST, United States, Physikalisch-Technische Bundesanstalt, PTB, Germany, and the Laboratoire National D'Essais, LNE, France.

- Traceability of mass is maintained to the fundamental unit of the kilogram (kg) through reference mass set R100 measured by Troemner Calibration Services who maintains direct traceability to the National Institute of Standards and Technology (NIST).

- DHI local gravity has been determined through the National Geodetic Survey gravity prediction.

The traceability to NIST or other national metrology institutes for secondary measurement standards is established through laboratories approved by the DH Instruments quality assurance program. Test reports for references maintained by DHI are available upon request to the recipient of this calibration report.

Metrologist

ilac-MRA

A2LA ACCREDITED CALIBRATION 1699.01

Laboratory Representative

FLUKE
= DH Instruments
Report: 1283471697
Cal Date: 13 Sep 2010
Due Date:
SN: 112333
Tech: RAC
602.431.9100 dhinstruments.com

Pursuant to the requirements of DHI Quality Procedures, DHI does not provide a calibration due date unless you have specifically requested us to assign an interval in your purchasing documentation. If requested the calibration due date is given on the calibration sticker attached to this report. If there is not a calibration sticker delivered with this report, it is possible this device did not meet the uncertainty specifications listed in the body of this calibration report.

Fluke Corporation, DH Instruments Division
4765 East Beautiful Lane, Phoenix, AZ 85044 USA
Telephone 602.431.9100
Facsimile 602.431.9559
Internet www.dhinstruments.com

CALIBRATION REPORT NO. 1283471697
Page 3 of 3
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TEST RESULTS (CONT.)

RANGE 1 AS RECEIVED

REFERENCE PRESSURES (kPa)	TEST READING (kPa)	ABSOLUTE DISAGREEMENT (kPa)	AS RECEIVED TOLERANCE +/-(kPa)
96.98	93.83	-3.16*	0.68
1338.30	1335.23	-3.07*	0.68
2715.44	2712.65	-2.79*	0.68
4092.58	4090.13	-2.45*	0.68
5469.72	5467.19	-2.53*	0.68
6846.85	6844.43	-2.42*	0.68
5469.72	5466.98	-2.74*	0.68
4092.58	4089.89	-2.69*	0.68
2715.44	2712.47	-2.97*	0.68
1338.30	1335.11	-3.19*	0.68
96.97	94.00	-2.97*	0.68
PA:	0 Pa		
PM:	1.00000		

RANGE 1 AS LEFT

REFERENCE PRESSURES (kPa)	TEST READING (kPa)	ABSOLUTE DISAGREEMENT (kPa)	ADJUSTMENT TOLERANCE +/-(kPa)
96.98	96.96	-0.02	0.68
1338.30	1338.23	-0.07	0.68
2715.44	2715.51	0.07	0.68
4092.58	4092.85	0.26	0.68
5469.72	5469.76	0.04	0.68
6846.85	6846.85	0.00	0.68
5469.72	5469.55	-0.17	0.68
4092.58	4092.60	0.02	0.68
2715.44	2715.33	-0.11	0.68
1338.30	1338.11	-0.19	0.68
96.97	97.13	0.17	0.68

PA: 3145.9 Pa
PM: 0.999894

REF ID: SN 1D DHI P-C cal date: 20090406 - 20110406, SN 2056 DHI M/S cal date: 20090928 - 20100928, SN 180 DHI BASE cal date: 20100804 - 20110804
REFERENCE UNCERTAINTY±(0.0032% of rdg + 50Pa)

* Indicates out of tolerance data under the auspices of ANSI/NCSL Z540-1-1994, NRC 10 CFR 21, or other quality assurance requirements.

EDF – EQUIPMENT DISCREPANCY FORM

Identifies Out Of Tolerances, Damage or Contamination of Customer's Test Instruments or DHI M&TE Affecting Customer's Test Instruments

FLUKE ® – DH Instruments

Date	Customer	Calibration Report No.	Reporter
9/13/2010	CARGILL SALT	1283471697	Raymond A. Clapper

CONCERNING:

Item:

Paroscientific Model 765-16B, SN 112333

DESCRIPTION OF CONDITION AND CONTAINMENT

Out of tolerance as receivedCalibrated to specifications, applied new coefficients. In tolerance as left.

QA COMMENTS

Out of tolerance data noted in report.

Attachments: None

Metrologist

13 SEPT 2010
Date

FLUKE®
DH Instruments

CALIBRATION REPORT NO. 1284363720
Calibration Date: September 13, 2010
For:
CARGILL SALT
WATKINS GLEN, NEW YORK
Purchase Order Number: 20022857
Calibration of:
Paroscientific Model 765-16B, No. 112335

QUALITY PROGRAM CONFORMANCE

All calibrations are performed in accordance with DHI Laboratory Quality Assurance Program Manual (LQAPM), Rev. D, dated October, 2009 and conform to ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO/IEC Guide 25, ISO 9002, ISO-10012-1, MIL-STD 45662A and when specified by our customers NRC regulations 10CFR50 Appendix B and 10CFR21, and/or other quality requirements defined in customers purchase descriptions.

TRACEABILITY

Traceability for pressure is maintained through the fundamental units of mass [kg] and length [m^2] and the derived unit of acceleration of gravity [m/s^2].

- The traceability of effective area is maintained through the 2010 DHI Piston-Cylinder Calibration Chain to the National Institute of Standards and Technology, NIST, United States, Physikalisch-Technische Bundesanstalt, PTB, Germany, and the Laboratoire National D'Essais, LNE, France.

- Traceability of mass is maintained to the fundamental unit of the kilogram (kg) through reference mass set R100 measured by Troemner Calibration Services who maintains direct traceability to the National Institute of Standards and Technology (NIST).

- DHI local gravity has been determined through the National Geodetic Survey gravity prediction.

The traceability to NIST or other national metrology institutes for secondary measurement standards is established through laboratories approved by the DH Instruments quality assurance program. Test reports for references maintained by DHI are available upon request to the recipient of this calibration report.

Metrologist

ilac-MRA

A2LA ACCREDITED CALIBRATION 1599.01

Laboratory Representative

FLUKE
DH Instruments
Report: 1284363720
Cal Date: 13 Sep 2010
Due Date:
SN: 112335
Tech: RAC
602.431.9100 dhinstruments.com

Pursuant to the requirements of DHI Quality Procedures, DHI does not provide a calibration due date unless you have specifically requested us to assign an interval in your purchasing documentation. If requested the calibration due date is given on the calibration sticker attached to this report. If there is not a calibration sticker delivered with this report, it is possible this device did not meet the uncertainty specifications listed in the body of this calibration report.

Fluke Corporation, DH Instruments Division
4765 East Beautiful Lane, Phoenix, AZ 85044 USA
Telephone 602.431.9100
Facsimile 602.431.9559
Internet www.dhinstruments.com

CALIBRATION REPORT NO. 1284363720
Page 2 of 3
September 13, 2010

DEVICE UNDER TEST IDENTIFICATION

The device under test consists of an **Paroscientific Model 765-16B, No. 112335** with a manufacturers stated accuracy of ±0.01% of full scale.

TEST CONDITIONS

- Reference pressures were applied by DHI working standards whose identity and uncertainty are identified with the data tables. All uncertainties are based on the methods described in ANSI/NCSL Z540-2-1997 using a coverage factor of 2.
- Four hours were allowed for the device under test temperature to stabilize before commencing the test. Ambient conditions throughout the calibration were 21 to 25 °C, 10 to 70% RH and 96 to 100 kPa.
- Procedure used: LAB116E
- Reference level: Test connection

TEST RESULTS

A table for each calibrated range lists the following:

1. Reference pressure: Pressure defined by the reference at equilibrium
2. Test reading: Pressure displayed by the device under test
3. Absolute Disagreement: Test - Reference
4. Tolerance: ± 0.01% F.S.
5. Range Coefficients

CALIBRATION REPORT NO. 1284363720
Page 3 of 3
September 13, 2010

TEST RESULTS (CONT.)

RANGE 1 AS RECEIVED

REFERENCE PRESSURES (kPa)	TEST READING (kPa)	ABSOLUTE DISAGREEMENT (kPa)	AS RECEIVED TOLERANCE +/-(kPa)
96.97	95.40	-1.57*	0.68
1338.29	1336.88	-1.41*	0.68
2715.44	2714.06	-1.38*	0.68
4092.58	4090.97	-1.61*	0.68
5469.72	5467.93	-1.79*	0.68
6846.86	6845.16	-1.70*	0.68
5469.72	5468.07	-1.65*	0.68
4092.59	4091.10	-1.49*	0.68
2715.45	2714.07	-1.38*	0.68
1338.30	1336.90	-1.40*	0.68
96.98	95.50	-1.48*	0.68

PA: 0 Pa
PM: 1.00000

RANGE 1 AS LEFT

REFERENCE PRESSURES (kPa)	TEST READING (kPa)	ABSOLUTE DISAGREEMENT (kPa)	ADJUSTMENT TOLERANCE +/-(kPa)
96.97	96.81	-0.16	0.68
1338.29	1338.34	0.04	0.68
2715.44	2715.58	0.14	0.68
4092.58	4092.55	-0.04	0.68
5469.72	5469.56	-0.16	0.68
6846.86	6846.85	-0.01	0.68
5469.72	5469.70	-0.02	0.68
4092.59	4092.67	0.09	0.68
2715.45	2715.58	0.14	0.68
1338.30	1338.36	0.06	0.68
96.98	96.91	-0.07	0.68

PA: 1402.1 Pa REF ID: SN 1D DHI P-C cal date: 20090406 - 20110406, SN 2056 DHI M/S cal date: 20090928 - 20100928, SN 180 DHI BASE cal date: 20100804 - 20110804
PM: 1.000042 REFERENCE UNCERTAINTY±(0.0032% of rdg + 50Pa)

* Indicates out of tolerance data under the auspices of ANSI/NCSL Z540-1-1994, NRC 10 CFR 21, or other quality assurance requirements.

Paroscientific, Inc.
4500 148th Avenue N. E.
Redmond, WA 98052-5194
Telephone: (425) 883-8700
Facsimile: (425) 867-5407
Email: support@paroscientific.com
Internet:http://www.paroscientific.com

CERTIFICATE OF CONFORMANCE

CUSTOMER: CARGILL SALT

PURCHASE ORDER: 20022802

DIGIQUARTZ MODEL: 765-1K

PART NUMBER: 1100-017-0

SERIAL NUMBER(S): 115418

PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The Digiquartz model(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure, temperature standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001:2008.

Warren Schuchman 9/8/10

AUTHORIZED SIGNATURE DATE

Warren Schuchman, Quality Assurance

Digiquartz® Technology

Precision Pressure Instrumentation

Paroscientific, Inc.

An ISO9001:2008 registered company

4500 148th Avenue N. E. Facsimile: (425) 867-5407
Redmond, WA 98052-5194 Email:support@paroscientific.com
Telephone: (425) 883-8700 Internet:http://www.paroscientific.com

CERTIFICATE OF CALIBRATION

DIGIQUARTZ MODEL: 765-1K
SERIAL NUMBER(S): 115418

The Paroscientific Digiquartz Model (s) identified above has been calibrated and tested with one or more of the following primary pressure standards. All have traceability to the National Institute of Standards and Technology.

Bell and Howell Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester Part Number: 6-201-0001, S/N 4034 and S/N 1014

☐ Piston/Cylinder: 6-001-0002, P2-919/C2-1523,
Weight Set 1: 6-002-0002
Range: 1.5 to 50 psi [10 to 345 kPa]
Accuracy: 0.010 percent of reading

☐ Piston/Cylinder: 6-001-0001, P1-949/C1-922, Weight Set 2: 6-002-0002
Range: 0.3 to 5 psi [2 to 34 kPa]
Accuracy: 0.015 percent of reading

☒ Piston/Cylinder: 6-001-0002, P2-652/C2-1378,
Weight Set 2: 6-001-0002
Range: 1.5 to 50 psi [10 to 345 kPa]
Accuracy: 0.010 percent of reading

DH Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester Part Number: PG7601 S/N 161

☐ Piston/Cylinder: S/N 305, Mass Set: S/N 2052
Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0.29 to 50 psi [2 to 345 kPa] gauge mode
Accuracy: 0.002 percent of reading

DH Primary Pressure Standard

Pneumatic Gauge Dead Weight Tester, Model 5203, S/N 5557

☒ Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/N 3293
Range: 20 to 1,600 psi [0.14 to 11 MPa]
Accuracy: 0.005 percent of reading

DH Primary Pressure Standard

Oil Operated Gauge Dead Weight Tester, Model 5306, S/N 3505

☐ Piston/Cylinder: S/N 3375, Mass Set: S/N 2032
Range: 40 to 20,000 psi [0.3 to 138 MPa]
Accuracy: 0.01 percent of reading above 200 psi [1.4 MPa]
or 0.02 psi [0.14 kPa] at lower pressure

☐ Piston/Cylinder: S/N 3511, Mass Set: S/N 2032
Range: 145 to 72,500 psi [1 to 500 MPa]
Accuracy: 0.02 percent of reading above 725 psi [5 MPa]
or 0.145 psi [1 kPa] at lower pressure

PARO TEST 17

Tested By: _____ DATE: *9/8/10*

Paroscientific, Inc.
Pressure Instrument Configuration

SN: 115418 Part Number: 1100-017-0 Model: 765-1K Port: Oil Filled

Calibration Date: 08-Sep-10 Report No: 11805 Technician: WMR

Pressure Range: 0 to 1,000 psia Temperature Range: 0 to +40 deg C

Customer: Cargill Salt
Address : 518 East Fouth Street
Watkins Glen, NY 14891 USA

Report Date: 08-Sep-10
Sales Order: 27903
S/R Number :

Configuration

BL: 0	PT: N
BR: 9600	QD: -
DD: -	QO: -
DL: 0	SL: -
DM: 0	SN: 115418
DO: -	ST: -
DP: 6	SU: 0
ID: 01	TI: 670
IM: -	TR: 952
LL: -	TU: 0
LH: -	UF: 1.000000
MC: Y	UL:
MD: 1	UM: USER
MN: 765-1K	UN: 1
OP: -	US: 0
PF: 1000.000	VR: P1.06
PI: 670	ZI: 0
PL: 1200.000	ZS: 0
PO: 0	ZL: 0
PR: 238	ZV: .0000000
PS: 0	
AL: .0000000	
AU: 1000.000	
GD: 0	
GT: 0	
LW: 0	
PC: 1.000000	
PX: 5	
RS: 1	
RU: -	

Calibration Coefficients

U0:	5.812545	µsec
Y1:	-3848.316	deg C / µsec
Y2:	-14219.56	deg C / µsec^2
Y3:	-121702.8	deg C / µsec^3
C1:	-4514.769	psi
C2:	142.378	psi / µsec
C3:	13782.01	psi / µsec^2
D1:	0.0672987	
D2:	0.0000000	
T1:	30.00541	µsec
T2:	0.902208	µsec / µsec
T3:	42.19619	µsec / µsec^2
T4:	3.768201	µsec / µsec^3
T5:	1088.066	µsec / µsec^4
TC:	0.6781705	
PA:	0.0000000	
PM:	1.0000000	

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Prepared by

PARO TEST 17

Digiquartz® Technology